

thm_2Erich_list_2EIS_SUBLIST_REVERSE (TMZXNHKKtSiiwjRtpXXrjJJqpH3KUCgux4b)

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Definition 1 We define $c_2Emin_2E_3D_3D_3E$ to be $\lambda P \in 2.\lambda Q \in 2.inj_o (p P \Rightarrow p Q)$ of type ι .

Definition 2 We define $c_2Emin_2E_3D$ to be $\lambda A.\lambda x \in A.\lambda y \in A.inj_o (x = y)$ of type $\iota \Rightarrow \iota$.

Definition 3 We define $c_2Ebool_2E_ET$ to be $(ap (ap (c_2Emin_2E_3D (2^2)) (\lambda V0x \in 2.V0x)) (\lambda V1x \in 2.V1x))$

Let $ty_2Elist_2Elist : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A0.nonempty A0 \Rightarrow nonempty (ty_2Elist_2Elist A0) \quad (1)$$

Let $c_2Elist_2EREVERSE : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A_27a.nonempty A_27a \Rightarrow c_2Elist_2EREVERSE A_27a \in ((ty_2Elist_2Elist A_27a)^{(ty_2Elist_2Elist A_27a)}) \quad (2)$$

Let $c_2Elist_2EAPPEND : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A_27a.nonempty A_27a \Rightarrow c_2Elist_2EAPPEND A_27a \in (((ty_2Elist_2Elist A_27a)^{(ty_2Elist_2Elist A_27a)})^{(ty_2Elist_2Elist A_27a)}) \quad (3)$$

Definition 4 We define $c_2Emin_2E_40$ to be $\lambda A.\lambda P \in 2^A.if (\exists x \in A.p (ap P x)) \text{ then } (the (\lambda x.x \in A \wedge P x))$ of type $\iota \Rightarrow \iota$.

Definition 5 We define $c_2Ebool_2E_3F$ to be $\lambda A_27a : \iota.(\lambda V0P \in (2^{A-27a}).(ap V0P (ap (c_2Emin_2E_40 A_27a) P)))$

Let $c_2Erich_list_2EIS_SUBLIST : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A_27a.nonempty A_27a \Rightarrow c_2Erich_list_2EIS_SUBLIST A_27a \in ((2^{(ty_2Elist_2Elist A_27a)})^{(ty_2Elist_2Elist A_27a)}) \quad (4)$$

Definition 6 We define $c_2Ebool_2E_21$ to be $\lambda A_27a : \iota.(\lambda V0P \in (2^{A-27a}).(ap (ap (c_2Emin_2E_3D (2^{A-27a})) P) P)))$

Assume the following.

$$True \quad (5)$$

Assume the following.

$$(\forall V0t1 \in 2.(\forall V1t2 \in 2.(((p V0t1) \Rightarrow (p V1t2)) \Rightarrow (((p V1t2) \Rightarrow (p V0t1)) \Rightarrow ((p V0t1) \Leftrightarrow (p V1t2)))))) \quad (6)$$

Assume the following.

$$\forall A_27a.nonempty A_27a \Rightarrow (\forall V0x \in A_27a.((V0x = V0x) \Leftrightarrow True)) \quad (7)$$

Assume the following.

$$\begin{aligned} & \forall A_27a.nonempty A_27a \Rightarrow (\forall V0l1 \in (ty_2Elist_2Elist \\ & \quad A_27a).(\forall V1l2 \in (ty_2Elist_2Elist A_27a).(\forall V2l3 \in \\ & \quad (ty_2Elist_2Elist A_27a).((ap (ap (c_2Elist_2EAPPEND A_27a) \\ V0l1) (ap (ap (c_2Elist_2EAPPEND A_27a) V1l2) V2l3)) = (ap (ap (c_2Elist_2EAPPEND \\ A_27a) (ap (ap (c_2Elist_2EAPPEND A_27a) V0l1) V1l2)) V2l3)))))) \quad (8) \end{aligned}$$

Assume the following.

$$\begin{aligned} & \forall A_27a.nonempty A_27a \Rightarrow (\forall V0l1 \in (ty_2Elist_2Elist \\ & \quad A_27a).(\forall V1l2 \in (ty_2Elist_2Elist A_27a).((ap (c_2Elist_2EREVERSE \\ & \quad A_27a) (ap (ap (c_2Elist_2EAPPEND A_27a) V0l1) V1l2)) = (ap (ap (\\ & \quad c_2Elist_2EAPPEND A_27a) (ap (c_2Elist_2EREVERSE A_27a) V1l2)) \\ & \quad (ap (c_2Elist_2EREVERSE A_27a) V0l1)))))) \quad (9) \end{aligned}$$

Assume the following.

$$\begin{aligned} & \forall A_27a.nonempty A_27a \Rightarrow (\forall V0l \in (ty_2Elist_2Elist \\ & \quad A_27a).((ap (c_2Elist_2EREVERSE A_27a) (ap (c_2Elist_2EREVERSE \\ & \quad A_27a) V0l)) = V0l)) \quad (10) \end{aligned}$$

Assume the following.

$$\begin{aligned} & \forall A_27a.nonempty A_27a \Rightarrow (\forall V0l1 \in (ty_2Elist_2Elist \\ & \quad A_27a).(\forall V1l2 \in (ty_2Elist_2Elist A_27a).((p (ap (ap (c_2Erich_list_2EIS_SUBLIST \\ & \quad A_27a) V0l1) V1l2)) \Leftrightarrow (\exists V2l \in (ty_2Elist_2Elist A_27a).(\\ & \quad \exists V3l_27 \in (ty_2Elist_2Elist A_27a).(V0l1 = (ap (ap (c_2Elist_2EAPPEND \\ & \quad A_27a) V2l) (ap (ap (c_2Elist_2EAPPEND A_27a) V1l2) V3l_27)))))))))) \quad (11) \end{aligned}$$

Theorem 1

$$\begin{aligned} & \forall A_27a.nonempty A_27a \Rightarrow (\forall V0l1 \in (ty_2Elist_2Elist \\ & \quad A_27a).(\forall V1l2 \in (ty_2Elist_2Elist A_27a).((p (ap (ap (c_2Erich_list_2EIS_SUBLIST \\ & \quad A_27a) (ap (c_2Elist_2EREVERSE A_27a) V0l1)) (ap (c_2Elist_2EREVERSE \\ & \quad A_27a) V1l2))) \Leftrightarrow (p (ap (ap (c_2Erich_list_2EIS_SUBLIST A_27a) \\ & \quad V0l1) V1l2)))))) \end{aligned}$$